



RDI Advising Model for improving the teaching-learning process

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Abstract

Introduction. Advising in Educational Psychology from the perspective of RDI takes on a stronger investigative, innovative nature. The model proposed by De la Fuente et al (2006, 2007) and Education & Psychology (2007) was applied to the field of improving teaching-learning processes at a school. Hypotheses were as follows: (1) interdependence relationships between the process of teaching and of learning; (2) the effect of improved specific behaviors in teaching and learning.

Method. A total of 10 teachers and 159 students from Secondary Education participated in the project. The design used for the evaluation-research phase was quasi-experimental for a single case, with pre-post evaluation. The IATLP Scales (De la Fuente & Martínez, 2004) were used as evaluation instruments.

Results. Significant correlations and interdependence relationships appeared throughout assessment of the teaching-learning process. The intervention produced a significant main effect of *time*. Likewise the *teacher* factor also showed differences.

Discussion. Advising for intervention and improvement of the teaching-learning process demonstrated significant improvement of both a general and specific nature in those aspects of the teaching and learning process which were addressed in the advisory program, after the intervention.

Conclusions. The conception of the RDI Area, as a new area for advising in Educational Psychology, can represent a launchpad for research-based innovation in the practice of advising and in education.

Key words: advising in Educational Psychology, RDI area, improving the teaching-learning process, educational innovation.

Received: 09-12-07

Initial acceptance: 10-14-07

Final acceptance: 10-23-07

Introduction

The task and professional profile of the educational adviser has been the object of many definitions and conceptions. This is due both to the evolution of educational conceptions as well as to educational demands in each era and to the progress of scientific knowledge in this discipline which upholds professional practice.

Psychoeducational advising from a research and innovation approach

Psychoeducational advising has been established as a complex, multidimensional task for supporting the design and development of educational action in all its aspects (De la Fuente, 2005, 2007a, 2007b, 2007c; Monereo & Pozo, 2005; Monereo & Solé, 1996). Academic-professional competencies needed for practicing this profession include those involved in research, development of tools and professional action, and an innovative spirit—important competencies that have not been highly developed (De la Fuente, Justicia, Casanova & Trianes, 2005).

Legislative framework

The Spanish legislative framework has also established their importance. Organic Law 2/2006 for Education (LOE) mentions in its preamble the concern of education offering *responses to the changing needs and demands* of persons and social groups. Article 1 of the LOE, with regard to educational principles, establishes in section f that educational and professional guidance are a necessary means for achieving personalized preparation that gives priority to education of the whole person in knowledge, skills and values. Elsewhere, article 91.d) establishes the functions of teachers to include educational, academic and professional guidance for students, in conjunction with specialized services or department.

In the region of Andalusia (Spain), the Order from May 15, 2006 (BOJA June 6, 2006), establishing norms for being awarded grants for projects in educational innovation at public schools in Andalusia, interprets *innovation* as the set of ideas, processes and strategies for introducing and consolidating changes in educational practices, considering it a fundamental, essential factor for improving quality in schools. Therefore, the practice of teaching must be understood as an activity subject to a continuous process of reflection and analysis of a specific school reality, and of the teaching and learning processes which take place therein.

This way, curriculum development and educational innovation are to be seen as related, complementary aspects.

Further, the Spanish educational system promotes the autonomy of schools as a principle which allows the curriculum to be adapted for particular responses to student diversity and the diversity of school contexts. Thus, the need is evident to incorporate these processes in the practice of teaching and guidance. According to Article 2 from this same Order, also Article 4 from the July 21, 2006 Order (BOJA August 3, 2006), educational innovation projects should meet the following characteristics:

- Propose the introduction of *innovative changes in the practice of teaching* or in the life of the school, in order to improve school results and educational processes, whether they are academic, organizational or functional.
- Promote teachers' self-study and teamwork, as well as their involvement and active participation in the search for, adoption of and consolidation of *innovative practices* over time.
- Be founded on the teachers' own *process of reflection, inquiry and/or research* on their own educational practice.
- Incorporate *evaluation procedures* covering the scope and effectiveness of changes and improvements which are expected.

Complementary to innovation tasks are *processes of educational research* (Order from the Department of Education, May 15, 2006, establishing the basis for stimulating educational research at public schools in the Andalusia region (BOJA nº 113, June 14, 2006). Educational research has been one of the principles which *upholds quality and improvement of the educational system*, as indicated in Organic Law 1/1990, December 3, on the General Structuring of the Educational System, in article 55.d. Likewise, Decree 110/2003, which regulates the Andalusian System of Ongoing Teacher Development indicates that the purpose of this system is to promote professional development of teachers and to improve educational practice. It is understood that processes of educational research make it possible to address changes *at a deeper level than in innovation experiences*.

The II Andalusian Plan for Ongoing Teacher Development also contributes to this purpose, seeking to improve educational practices directed at higher quality of student learning, and at producing greater knowledge of education, by encouraging and valuing diversity,

innovation and rigorous experimentation. It anticipates and supports groups of teachers being involved in educational research and experimentation, in as many training initiatives as are launched. Educational research is essential for improving professional practice, linking it to the *study of teaching-learning processes*, in the contexts where they occur and with the persons who are involved. Research and innovation often go hand in hand, but they have different meanings. Research tests the theoretical and practical assumptions which uphold educational action in its reality, making it possible to progress in knowledge, understanding and improvement of educational processes. Along these lines, the Order from May 15, 2006, article 2.b considers ongoing teacher development in the area of research. Article 4 establishes different *forms of research* (case studies, biographies, observations, interviews and action-research), giving priority to those cases relating to homeroom teaching and guidance (gender perspective, instrumental materials, information technology, diversity and interculturality, coexistence, teaching methodologies).

Along these lines, the Order from July 27, 2006, regulating specific aspects of the *Plan for Guidance and Homeroom Teaching* at secondary schools, defines these elements of the Plan in Article 5: a) Homeroom teaching; b) Academic and Professional Guidance, and c) Attention to Diversity.

The RDI Area in Psychoeducational Advising

Some current approaches to the task of guidance or psychoeducational advising have established that this professional task should be fortified with a new area, spanning across the three areas already classic to advising: (1) Advising the area of *Homeroom Teaching* for optimization of personal development and learning (and teaching); (2) Advising the area of *Academic and Vocational* orientation; and (3) Advising the area of *Attention to Diversity and Specific Educational Needs*.

This new cross-sectional area, referred to as (4) Advising the area of *research, development and innovation* (RDI) in educational processes (De la Fuente, Peralta & Sánchez, 2007; De la Fuente, Peralta, Sánchez, Martínez, Justicia, Pichardo, Berbén & Benítez, 2007) can become the area that gives consistency and continuity to the work of advisory and guidance professionals, referring to a strengthening of action-research in the classroom, innovation and improvement in educational quality. The use of ICT takes on special relevance in

this area (Bloom & Walz, 2000; Cogoi, 2005; Garrison & Anderson, 2003; Sobrado, 2006). More concretely, this proposal is broken down into different Work Areas (De la Fuente, Peralta, Sánchez, Martínez, Justicia, Pichardo, Berbén & Benítez, 2007; Education & Psychology, 2007), although here we specify only those pertaining to *evaluation and improvement of teaching-learning processes*:

1) *Area of Psychoeducational Research:*

· Justification:

This area of work refers to the need for advisers to apply their advisory labor to *educational and psychoeducational research practice*, to both the processes and products of the Organization and of the Guidance Department itself. This means there is a need for these professionals to have professional competencies relating to the process of making research decisions (De la Fuente, 2003, 2006; De la Fuente, Justicia, Casanova & Trianes, 2005).

· Objectives of this advisory area:

1. Assume theoretical models for Applied Research on Processes and Products (evaluation and professional intervention) in the chosen problem area.
2. Apply Models of Instruments and Tools for research on and/or evaluation of their problem area or reality.
3. Execution of Research Design and Professional Intervention.
4. Data Analysis and Processing.
5. Establishing Conclusions.
6. Producing a Research Report.
7. Publication and/or Communication of Results.
8. Familiarity with recent professional research

· Services to the organization:

1. *Subarea of Homeroom Teaching:*

- Investigative evaluation of learning processes.
- Investigative evaluation of teaching processes.

· Examples of Action:

1. Conceiving research for identification, evaluation of and intervention in educational and school psychology problem areas.
2. Articulating and executing applied Research Projects.
3. Presenting Scientific/Professional reports to the community, the institution or the organization, showing the effects and profitability of the actions carried out.

2) *Area of Psychoeducational Development:*

· Justification:

The area involves conceptualizing the task of advising and of the Guidance Department itself as an *essential agent for quality and scientific/technological development of new products* for the guidance task, especially those referring to evaluation and educational intervention. In this context ICT development as well as development of new evaluation and intervention instruments applied to professional practice take on special value.

· Objectives of this area:

1. Detect needs in educational practice and in the advisory work of guidance itself.
2. Develop, or take on already-existing models and tools proven in professional practice to be effective and to respond to relevant problem areas typical to professional practice.
3. Propose computer-based tools and technological developments to respond to school psychology problem areas.

· Services to the organization:

1. *Subarea of Homeroom Teaching:*

- Development and validation of Programs and Tools for Evaluation and Intervention in learning processes.
- Development and validation of Programs and Tools for Evaluation and Intervention in teaching processes.

· Actions:

1. Collaborate in the design and development of new tools and teaching-learning and and ICT applications, in the field of education and guidance.

2. Create new tools for evaluation, intervention and organization of information and knowledge in this professional field.

3) *Area of psychological innovation:*

· Justification:

This professional area refers to the role of making the Guidance Department *dynamic and innovative* in every area of educational practice. It involves improving quality and educational action at every level, especially in what refers to intervention for preventing problems and to execution of innovation experiences.

· Objectives of this Area:

1. Innovate in educational and school psychology practice, using experiences and tools which have been studied and validated.
2. Encourage innovation as a tool for personal and professional growth, generating scientific/technological settings in the professional field.
3. Integrate and generalize ICT in the educational field and the field of school psychology advising and guidance.

· Services to the organization:

1. *Subarea of Homeroom Teaching:*

- Innovation in the use of ICT, evaluation tools and intervention programs in learning processes.
- Innovation in the use of ICT, evaluation tools and intervention programs in teaching processes.

· Actions:

1. Innovate in teaching-learning processes.
2. Implement virtual learning communities.
3. Innovate in the day-to-day practice of educational and school psychology.

*RDI Advising for improving the teaching-learning process**A conceptual model to start from: the DEDEPRO™ model*

Changes in recent times in the conceptions of education and teaching offer evidence that recommends integration of regulated teaching into models which address self-regulated learning, taking the learning process and the teaching process as a single, interrelated, bidirectional process (De la Fuente, 2007). Concepts referring to regulated teaching and self-regulated learning have been clarified recently, introducing the difference between macro-processes and micro-processes in order to understand the teaching-learning process (De la Fuente, Justicia & Berbén, 2005). Among the former, *macro-regulation of the teaching process* refers to actions which the teacher carries out in order to regulate his or her own teaching process and to help students regulate their learning process, over an extended period of time. *Macro-regulation of the learning process* refers to actions which the student carries out in order to self-regulate learning over time. The two processes have been linked together to encourage a new conception of a *regulated teaching-learning process* where the following are interrelated: (a) regulated teaching over an extended time, differentiating this from the regulation of specific tasks, and (b) self-regulated learning, also over an extended time. *Micro-regulation of the teaching process* refers to actions and decision-making carried out by the teacher in order to teach at a specific time or a discrete activity; this would include specific didactic actions for teaching and helping learners to carry out a certain learning activity. *Micro-regulation of the learning process* refers to strategic actions and processes specific to learning in concrete activities performed by any student during any activity.

This new conception of regulated teaching provides the framework for the DEDEPRO™ model (Figure 1) proposed by De la Fuente and collaborators (De la Fuente, 2007; De la Fuente & Justicia, 2001, 2004; De la Fuente & Martínez, 2004), adapted from Biggs (2001). This model has undergone several changes due to results from the study and review of different educational variables and theories.

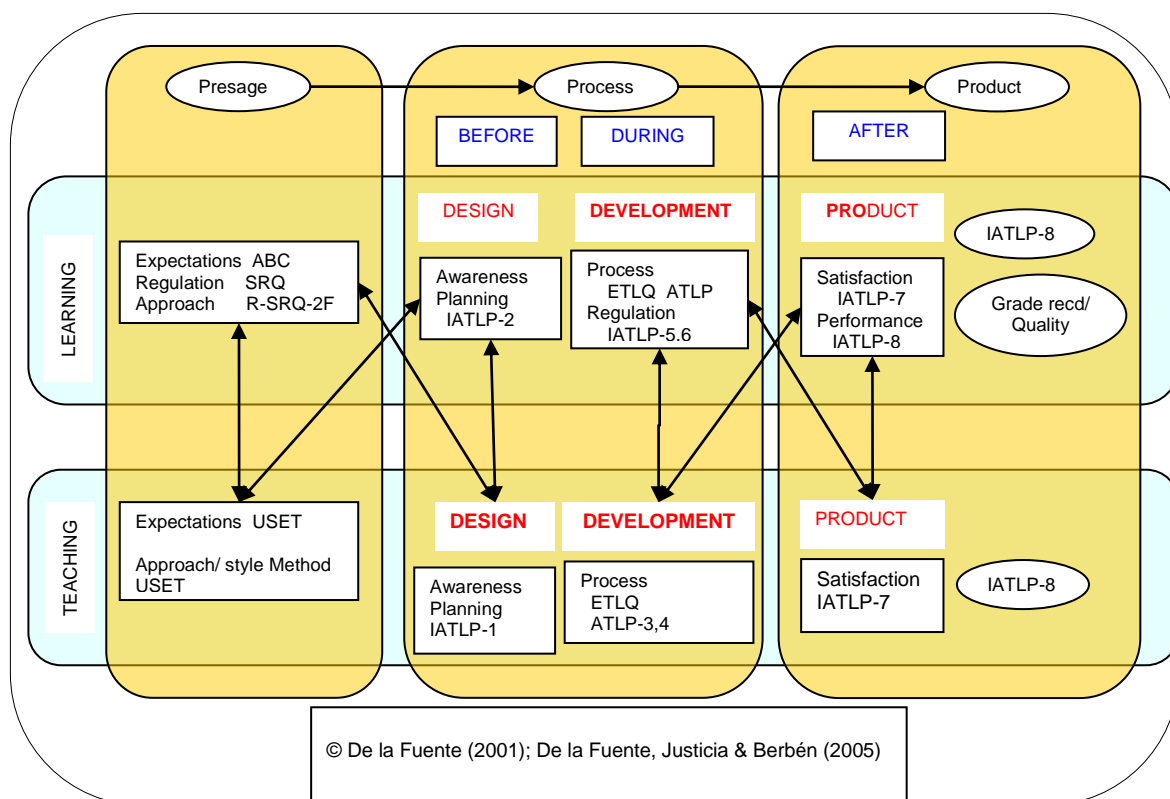


Figure. 1. DEDEPRO Interactive Model of Teaching – Learning. (Adapted from Biggs, 2001).

The DEDEPRO model (Design, Development and Product of teaching-learning), arises from the observation that teachers are lacking information about important elements of the teaching situation and have done little planning thereof, while students in turn have done very little planning of the design and development of their own learning over any extended time.

RDI Proposal for improving the teaching-learning process

In the first phase of strategic advising, objectives were linked to its participants (De la Fuente, 2006, 2007). The objectives of the action-research experience were to address the following:

1. Teacher: to experience a *Research & Development & Innovation* process in self-regulation of teaching (T/L), in its corresponding phases:
 - 1) before: awareness and planning of the T/L process
 - 2) during: regulation (control) of the T/L process

- 3) after: reflection (self-evaluation) and prospects for improving T/L
2. Students: to experience a *Research & Development & Innovation* process in self-regulation of learning (L), in its corresponding phases:
 - 1) before: awareness and planning of the L process
 - 2) during: regulation (control) of the L process
 - 3) after: reflection (self-evaluation) and prospects for improving L

The phases and times of *Research & Development & Innovation for improving the teaching-learning process* are presented in Table 1. The intention was for participants to have a meaningful experience of (1) reflection, self-evaluation, (2) preparation of personalized proposals for improving, and (3) innovative application of some of these.

Table 1.- Phases and times for advising in research & development & innovation (De la Fuente, 2006)

PHASE 1: DESIGN (PLANNING) FOR REGULATING THE TEACHING-LEARNING PROCESS. First Trimester.

September

1) AWARENESS (TEACHERS AND STUDENTS): RESEARCH

1. Initial evaluation of the T/L Process (teacher) with IATLP Scales (De la Fuente & Martínez, 2004).
2. Initial evaluation of the T/L Process (students) with IATLP Scales (op. cit).
3. Initial comparison of teachers' and students' perceptions.
4. Preparation of an initial personal profile of aspects to be improved:
 - goals for improved teaching: conceptions (1), development (3,4), satisfaction (7)
 - goals for improved learning: conceptions (2), development (5,6), satisfaction (8)

October:

2) PLANNING (TEACHERS) to be done for each Didactic Unit (5): DEVELOPMENT

1. Planning the *Design of each DU*: elements to be introduced in the T/L process:

· *Teaching process:*

· *Learning process*

1) what to teach:

↔

1) what to learn:

2) how to teach:

↔

2) how to learn:

3) when to teach:

↔

3) when to learn:

4) What, how and when to evaluate T:

↔

4) What, how and when to evaluate L

November

2. Planning the *Development of each sequence or face-to-face didactic action*:

2.1. *Didactic regulation of teaching*

1) Teacher's didactic behavior for regulation:

- Initial assessment question for the DU.
- Making DU objectives explicit.
- Presenting the content of the DU with a map or outline
- Relating the content to prior learning.
- Highlighting the most important content of the unit or topic.
- Restate at the end of each work session, what have we learned?
- (... as many as the teacher wishes to improve, based on the IATLP Scales)

2) Evaluation strategies for teaching:

- The students will correct each other's assignments and activities.
- I will return their assignments corrected
- (... as many as the teacher wishes to improve)

2.2. *Didactic regulation of learning*:

1) General learning regulation activities

-
- (...as many as the teacher wishes to improve)

2) Didactic regulation activities specific to an activity:

- Carry out an activity selection from within each DU, following the methodological sequence of the Pro-Regula Program (prepare the activity from each DU):
 - before: awareness and planning
 - during: strategies specific to the activity
 - after: self-evaluation and improvement

December:

3. Planning the *use of online utilities for Regulation*

3.1. *TLPA (teacher/student tutorial interaction)*:

1. *Didactic regulation of teaching (manner of teaching)*

1) Teacher's online didactic behavior for regulation:

- Presenting the DU lesson planning on line
- Making the objectives of the DU explicit.
- Relate the content to prior learning.
- Highlight the most important content of the unit or topic.
- Restate at the end of each work session, what have we learned?
- Respond to students' general questions for learning
- (...as many as the teacher or teachers wish to improve)

2) Online teaching strategies for evaluation:

- Give feedback on the activity performed
- Return the assignments corrected.
- Present the evaluation criteria
- Possibility for students to look over exams from earlier years
- (...as many as the teacher or teachers wish to improve)

2.2. *Didactic regulation of learning (manner of learning):*

1) General learning regulation activities

- Suggest specific strategies for different activities to perform within each activity.
-
- (...as many as the teacher or teachers wish to improve)

2) Didactic regulation activities specific to an activity:

- Online presentation of a strategic model for carrying out an activity
- Respond to specific questions about learning strategies for an activity
- Ask students to record online the learning strategies used during performance of a specific activity, in similar fashion to Pro-Regula (before, during, after), as in the program's written activity.
- (...as many as the teacher or teachers wish to improve)

3.2. *PLEYADE (tutorial interaction of the class group):*

1. *Online didactic regulation of teaching (manner of teaching)*

1) Teacher's online didactic behavior for regulation:

- Post general information online regarding events, news, materials, etc.
- Respond online to suggestions and questions from the class
- (...as many as the teacher or teachers wish to improve)

2) Online teaching strategies for evaluation:

- Provide general feedback to the class on-line regarding activities carried out
- (...as many as the teacher or teachers wish to improve)

2.2. *Online didactic regulation of learning (manner of learning):*

1) General learning regulation activities

- Encourage students to help each other online when performing and improving their activities (not mere copying).
- Ask the students to make suggestions to each other about specific strategies for different activities.
- (...as many as the teacher or teachers wish to improve)

2) Didactic regulation activities specific to an activity:

- encourage students to respond to specific questions about learning strategies for an activity
- Ask the students to share online the learning strategies used during the performance of a specific activity, in similar fashion to Pro-Regula (before, during, after), as in the program's written activity.
- (...as many as the teacher or teachers wish to improve)

PHASE 2: DEVELOPMENT FOR REGULATING (FOR CONTROL OF) THE TEACHING-LEARNING PROCESS. INNOVATION. Second Trimester.

January - April:

2.1. *Didactic development of each DU:* execution of strategies and regulatory actions introduced into the T/L Process:

· *teaching process:*

1) what to teach:

2) how to teach:

3) when to teach

4) What, how and when to evaluate T:

↔

↔

↔

↔

· *learning process:*

1) what to learn

2) how to learn

3) when to learn

4) What, how and when to evaluate L

2.2. *Control of the didactic process of each DU:*

1) Making didactic decisions.

2) Joint reflection among the team of teachers.

3) Evaluation, adjustment and improvement in each DU, T/L strategies and activities.

4) Observe and record the most significant events from the experience.

5) Keep records of the teacher's behaviors (didactic programming, notations, self-records, learning materials, etc.) which indicate a qualitative improvement in the teaching-learning process in general and of help for self-regulation of activities in particular.

6) Keep records of the students' behaviors (class activities, Pro-Regula activities, assignments, self-records, exams, etc.) which indicate a qualitative improvement in the learning process in general and in activities in particular.

PHASE 3: SELF-EVALUATION (REFLECTION) FOR REGULATION OF THE TEACHING-LEARNING PROCESS. RESEARCH. Third Trimester. Actions

May:

3.1. Evaluation of the T/L Process:

1. Final evaluation of the T/L Process (teacher).
2. Final evaluation of the T/L Process (students).
3. Final comparison of teacher's and students' perceptions.
4. Preparation of a profile of improved aspects:
 - improved teaching goals: conceptions (1), development (3,4), satisfaction (7)
 - improved learning goals: conceptions (2), development (5,6), satisfaction (8)
5. Preparation of a profile of aspects for further improvement:
 - improved teaching goals: conceptions (1), development (3,4), satisfaction (7)
 - improved learning goals: conceptions (2), development (5,6), satisfaction (8)
6. Analysis of the relationship of these aspects to academic performance and learning problems:
 - improvements made
 - unresolved problems: school failure.

June

3.2. Reflection on the educational innovation experience:

1. Analysis of results with the teaching staff
2. Elaboration of personal and team-based conclusions

July/September

3.3. Conclusions from the experience (Depts. involved and Guidance Dept., RDI Area)

1. Draft the final report of the RDI process for the School.
 2. Evaluation of teachers' satisfaction with the developmental process and didactic innovation.
 3. Presentation to the School Faculty and incorporation into the school's year-end report.
-

Objectives and hypotheses

The objective of this experience was to carry out a *research & development & innovation* intervention for improving the teaching-learning process (De la Fuente, 2006), based on the DEDEPRO™ model (De la Fuente, 2001, 2007; De la Fuente & Justicia, 2001, 2004; De la Fuente, Justicia & Berbén, 2005), during one academic year, using the *advisory model* designed by Education & Psychology I+D+i (2007). It was hypothesized that:

- 1) There would be a relationship of association and interdependence between the perception of regulation of the teaching process and of self-regulated learning.
- 2) This RDI advising intervention, based on the DEDEPRO model, would bring about significant discrete improvements, both in teachers' teaching behaviors, and students' learning behaviors.

Method

Participants

A total of 10 teachers and 159 students from Secondary Education participated in the *Project for Improving the Teaching-Learning Process*, during the 2005-2006 academic year. There was representation in classes from the Departments of Mathematics, Language Arts and Social Sciences, with 35 students from 1st year of Secondary, 42 students from 2nd year, 38 from 3rd year and 44 from 4th year. All were students from AGAVE School in Almería. All these were coordinated by the Guidance Department, RDI Area. The entire process was designed and led by the technology-based business, *Education & Psychology I+D+i* (www.education-psychology.com), in close collaboration with the EOS-Almería Delegation (www.psicoeduca-eosalmeria.com), who provided materials.

Design and variables

The design used for the *research-evaluation* phase was of a quasi-experimental nature, single class, with pre-post test evaluation. TIME was taken as an *intra-subject independent* variable. *Independent inter-subject variables* were: the TEACHER, the SUBJECT and the YEAR IN SCHOOL. For *dependent* variables, we took the IATLP Scales, with their dimensions and factors (De la Fuente & Martínez, 2004).

Procedure

During the 2005-2006 school year, the *initial research & development & innovation phase* was carried out, being presented to teachers as an action-research experience, as established by the protocol mentioned (De la Fuente, 2006); see Table 2. During school years 2007-2010, an *ongoing innovation intervention* is being carried out for improving the teaching-learning process, with progressive use of ICT tools which form part of this protocol (De la Fuente, 2006; Education & Psychology, 2007).

Table 2.- Example of the *Innovation* sequence for improving the teaching-learning process

AGAVE SCHOOL. Almería (Spain) GUIDANCE DEPARTMENT. RDI AREA.	
School year 2006-07 Project for improving the T/L process	
2 nd trimester	
Teacher	Student
<u>January</u> 1. At the beginning of each topic or lesson, the teacher explains why we are going to learn this content.	<u>January</u> 1. At the beginning of each topic or lesson, I want to know why we are going to learn this content.
<u>February</u> 2. At the beginning of each activity the teacher explains why we are going to do it. 3. The teacher presents the content that we are going to work on, using a conceptual map, diagram, outline or script.	<u>February</u> 2. At the beginning of each activity, I think about why we are going to do it. 3. At the beginning of each topic or lesson I represent the content that we are going to work on with some kind of conceptual map, diagram or outline.
<u>March</u> 4. The teacher shows the connection between the content we are going to work on and what has previously been learned. 5. The teacher shows what is the most important content from each topic or lesson.	<u>March</u> 4. At the beginning of each topic, I think about the relationships between this content that we are about to work on and what has been learned previously. 5. In each topic or lesson, I know what content is most important to learn.

3rd Trimester	
Teacher	Student
<p><u>April</u></p> <p>6. The teacher tries to determine whether the students have understood the learning objectives well.</p> <p><u>May</u></p> <p>7. The teacher allows students to talk in class about how they are learning.</p> <p>8. The teacher makes students reflect on their learning in order to improve it.</p> <p><u>June</u></p> <p>9. The teacher presents a work plan for each lesson or topic.</p> <p>10. The teacher evaluates what students know, at the beginning of each lesson or topic, through some activity.</p>	<p><u>April</u></p> <p>6. I ask when I have questions and do not keep my doubts to myself.</p> <p><u>May</u></p> <p>7. When I carry out learning activities I speak with my classmates about how they should be done.</p> <p>8. When I am going to learn something, I try to ask myself about what I am going to read.</p> <p><u>June</u></p> <p>9. I prepare a work plan for each topic or lesson.</p> <p>10. I evaluate what I already know when beginning a didactic unit.</p>

Materials and resources used:

1) *Printed:*

1. IATLP, Scales for the Interactive Assessment of the Teaching-Learning Process (De la Fuente & Martínez, 2004). See Table 3.

Table 3.- Structure of the Scales for the Interactive Evaluation of the Teaching-Learning Process (IATLP, De la Fuente & Martínez, 2004, 2007a)

- IATLP 1. Scale for evaluating the design of the T-L process - teacher
- IATLP 3. Scale for evaluating the development of the teaching process -teacher
- IATLP 5. Scale for evaluating the development of the learning process- teacher
- IATLP 7. Scale for evaluating the product of the learning process - teacher
- IATLP 2. Scale for evaluating the design of the learning process - student
- IATLP 4. Scale for evaluating the development of the teaching process - student
- IATLP 6. Scale for evaluating the development of the learning process - student
- IATLP 8. Scale for evaluating the product of the T/L process - student

2. PRO-REGULA Program, a program for learning how to regulate learning (De la Fuente & Martínez, 2000).

2) *Online:*

1. TLPA, virtual tool for improving the Design and Development of the Teaching-Learning process (De la Fuente & Trujillo, 2005; Education & Psychology, 2007).
2. PLEYADE. Virtual tool for sharing information among the group (De la Fuente & Martínez, 2002; Education & Psychology, 2007).

Statistical Analysis

The statistical design was carried out by researchers from Education & Psychology I+D+i. All the data was processed by researchers from the University of Almeria, using the SPSS Program, licensed for the University of Almeria. Correlation analyses, cluster analyses and univariate and multivariate analyses of variance were performed.

All the analyses were focused on assessments made by students who completed the scales IATLP 4 (Evaluating regulation of the teaching process) and IATLP 6 (Evaluation of self-regulation of the learning process), at the initial and end points of time in the improvement process. The teachers also completed the Scales, but they are not the object of this research report.

Results

Association relationships between the process of teaching and of learning

The Pearson bivariate correlations carried out between the total regulation of the teaching process (IATLP 4) and self-regulation of the learning process (IATLP-6) showed a significant correlation, $r=.712$, $p<.000$ ($n=284$). In complementary fashion, significant bivariate correlations appeared between the dimensions of teaching regulation and self-regulated learning (see Table 3). General behaviors (IATLP-4A) and specific behaviors (IATLP 4C) of the teacher's regulation of teaching, followed by regulated teaching for evaluation (IATLP-4B), are correlated positively and significantly with general behaviors (IATLP-6A) and specific behaviors (IATLP-6B) of students' self-regulation.

Table 3.- Bivariate correlations between regulation dimensions (n=284)

Reg. Learning	Regulation of teaching		
	IATLP-4A	IATLP-4B	IATLP-4C
IATLP-6A	.651***	.488***	.620***
IATLP-6B	.581***	.590***	.615***

*** The correlation is significant at a level of 0.001 (bilateral).

Interdependence relationships between the process of teaching and the process of learning

In order to establish interdependence relationships between regulation of the teaching process and of the learning process, groups of regulated teaching levels were created (low, medium, high), through a cluster analysis, K-means method, with central points of the clusters as follows: low (average score for regulated teaching was 2.78; n=100), medium (3.42; n=112) and high (4.05; n=51). From this grouping, an analysis of variance was performed, taking for independent variable the level of *regulated teaching* (level on IATLP-4) and for independent variable, *self-regulated learning* (IATLP-6).

Results show significant interdependence relationships. The factor *level of regulated teaching* (IATLP 4) was clearly able to establish interdependent levels on the dependent variable *self-regulated learning* (IATLP 6). See Table 4.

Table 4. ANOVA between the variables EIPEA 4 (IV) and EIPEA 6 (DV)

Regulated Learning (DV)	Regulated teaching (IV)			Effect
	1. Low (n=77)	2. Middle (n=93)	3. High (n=45)	
1. IATLP6.Regulated learning	2.98 (.45)	3.41 (.43)	3.92 (.42)	F (2.212)=77.20****
1. IATLP-6A. Self-regulation behaviors	2.78 (.53)	3.38 (.48)	3.95 (.47)	F (4.424)=29.94**** F (2.212)=80.20****
2. IATLP-6B. Self-regulation strategies	3.03 (.47)	3.44 (.47)	3.89 (.49)	F (2.212)=40.69**** 1<2<3 ****

**** $p < .0001$

Effects of the intervention carried out

Improvement in the teaching process according to TIME and TEACHER

Analyses of variance showed a significant, general effect of *TIME*, $F(1.247) = 6.10$, $p < .001$, $pre = 3.22 (.50)$ and $post = 3.40 (.53)$ and of the factor *TEACHER*, $F(9.247) = 4.17$, $p < .01$, in Pillai's Trace index, in assessment of the teaching process (Scale IATLP-4). These results can be visualized in Figure 2.

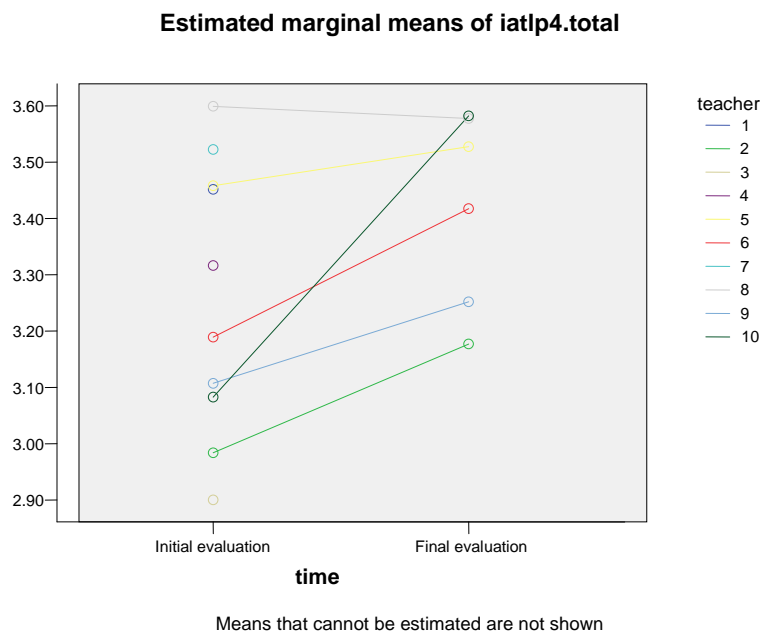


Figure 2

Similarly, three-dimensional ANOVAs on the learning process showed a general effect of *TIME*, $F(3.245) = 4.50$, $p < .004$, and of *TEACHER*, $F(27.741) = 4.50$, $p < .002$, in Pillai's Trace index. Furthermore, significant partial effects appeared for the factor *TIME* for evaluation strategies, $F(1.247) = 1.55$, $p < .01$, $pre\text{-}test = 3.04 (.49)$ and $post\text{-}test = 3.21 (.61)$, and self-regulation strategies, $F(1.247) = 3.72$, $p < .003$, $pre\text{-}test = 3.02 (.68)$ and $post\text{-}test = 3.33 (.67)$. Also, the *TEACHER* factor established significant differences in the different dimensions of regulation in the teaching process, for teaching behavior, $F(9.247) = 3.25$, $p < .001$; evaluation strategies, $F(9.247) = 3.01$, $p < .0021$, and self-regulation strategies, $F(9.247) = 3.59$, $p < .0000$. These effects can be seen graphically in Figures 3 and 4.

Estimated marginal means of iatlp4.evaluation

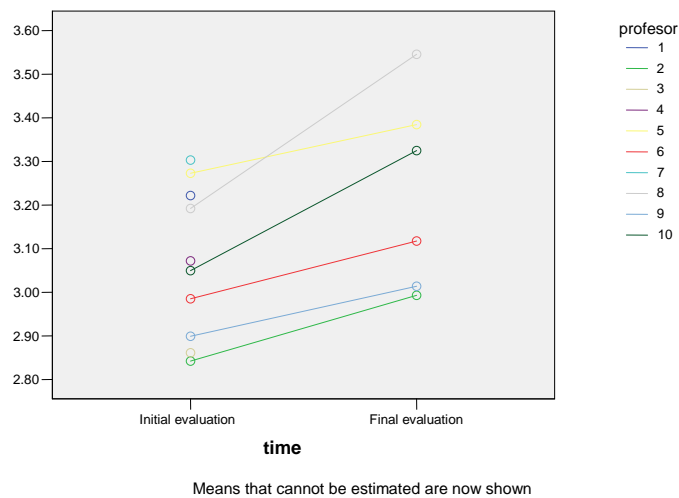


Figure 3

Estimated marginal means of iatlp4.regulation

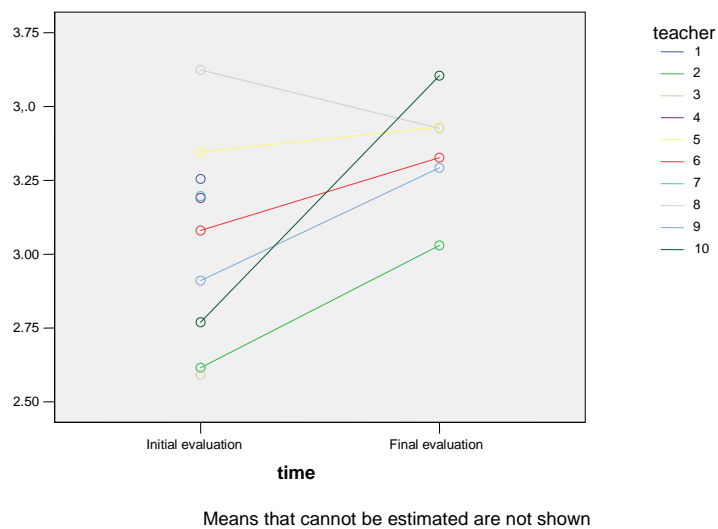


Figure 4

Improvement of the learning process according to TIME and TEACHER

Analyses of variance showed a general significant effect of *TIME* in assessing the learning process, $F(1,256) = 4.42$ ($p < .03$), showing a general increase in assessment of the learning process, pre-test=3.26 (.54) and post-test=3.50 (.60), with Pillai's Trace index. No significant effect appeared for the factor *TEACHER*. See Figure 5.

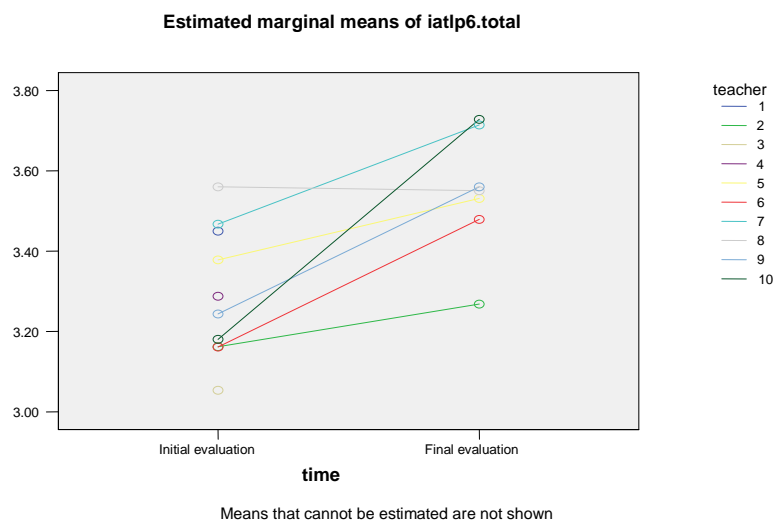


Figure 5

Multivariate analyses on the dimensions of improvement in the teaching process showed a specific improvement of the factor *TIME* in *self-regulation behaviors*, $F(1,256) = 4.48$, $p < .03$; pre-test=3.21 (.63) and post-test= 3.47 (.66), and of *self-regulation strategies*, $F(1,256) = 3.32$, $p < .07$; pre-test=3.33 (.53) and post-test= 3.54 (.63). No significant effect appeared for the factor *TEACHER*. These results are reflected in Figures 6 and 7.

Estimated marginal means of iatlp6.self-regulation behavior

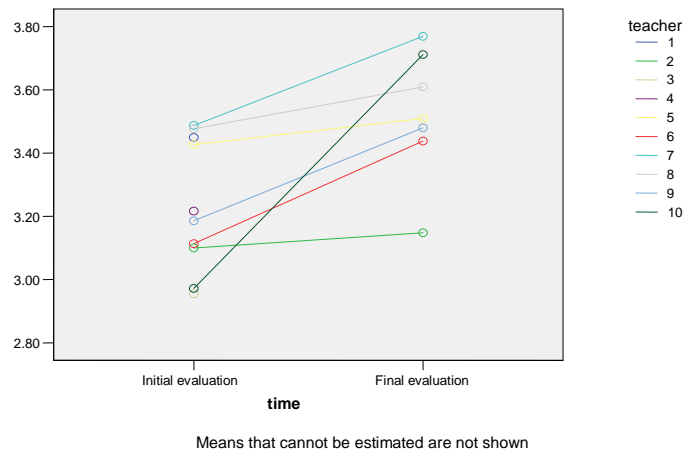


Figure 6

Estimated marginal means of iatlp6.self-regulation strategies

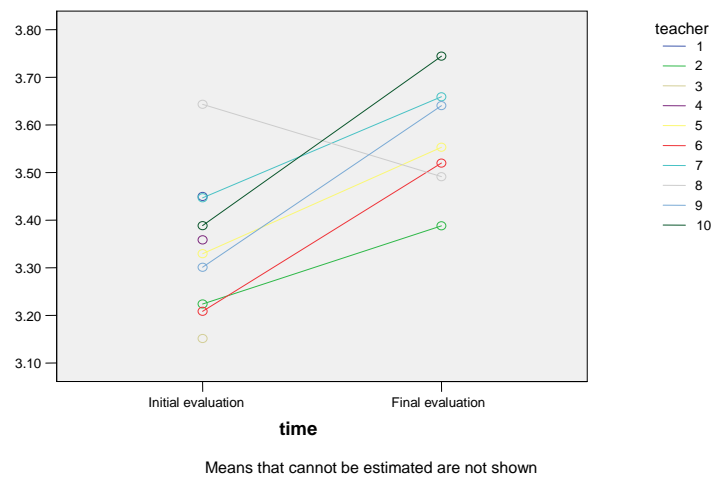


Figure 7

Discussion and conclusions

The results lead to conclusions in more than one direction. On one hand, assessment of the teaching process correlates with assessment of the learning process, both in general scores and in partial scores. This result is similar to others produced in previous studies with different scales, the ATLP Scales (De la Fuente & Justicia, 2001), a preliminary version of the IATLP Scales (García, De la Fuente, Justicia & colls., 2002) and with the Experiences in Teaching and Learning Questionnaire, ETLQ (Hounsell, Entwistle and colls., 2001-2003). This suggests a relationship of association and interdependence between perception of the teaching process and of the learning process, as appeared in the second results from this study.

Notwithstanding, the most important results, relating to the advising done for the intervention and improvement of the teaching-learning process, showed a significant general and specific improvement, in those aspects of the process of teaching and learning which were worked on in the advisory program after the intervention. Thus, the improvement found, that is, differences in the manner of teaching and the manner of learning continue to be significant, as expected. These results are similar to others found in a methodology with a non-equivalent control group (Sánchez, De la Fuente & Peralta, 2007a, 2007b). It is worth noting that effects were produced with the limited intervention time of a single academic year (2005-2006).

This study is also limited by the short period of the intervention. This means that longer advisory and intervention periods would bring about greater and more consistent changes in the teaching and learning behaviors. Precisely for this reason, a proposal has been put forward for the upcoming four years.

In summary, the concept of the RDI Area, as a new area in psychoeducational advising, generally speaking (De la Fuente et al., 2007; Education & Psychology, 2007), and more specifically, in the evolution and improvement of teaching and learning processes (De la Fuente, 1999, 2006), can mean a starting place for investigative innovation in the practices of advising and in education (Chocarro, González-Torres y Sobrino, 2007; Monereo, 2006; Torrano & González-Torres, 2004). Furthermore, it is an irreplaceable element for professional development, for revaluation and for providing a scientific-professional foundation for the

practice of advising, more in line with the philosophy of Andalusia, Spain and Europe in scientific-technological innovation (De la Fuente, 2007c), that can contribute to taking on the innovative character of educational advising that could always have been, but has yet to arrive (Fernández & Fernández, 2006).

Acknowledgments

This research was made possible thanks to the following subsidies:

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- 2) De la Fuente, J. (Dir.), Sánchez-Roda, M. D. & Peralta, F. J. (2005-2006). Proyecto Investigación de licencias por estudio “*Mejora de los procesos de enseñanza-aprendizaje, a través de procesos on-line, en el contexto de la orientación psicopedagógica*”. [Research Project of licenses by study, “*Improving teaching-learning processes through online processes in the context of school psychological guidance*.”] Official Call, 28 March 2005, for licenses by studies for civil servants in teaching, under the Department of Education of the Andalusian Regional Government (BOJA no. 75, 19 April 2005). Approved under the Resolution of 3 August 2005. Department of Education, Andalusian Regional Government (Spain).

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